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ABSTRACT

This paper describes a program for using higher order thinking skills to improve reading comprehension. The targeted population consists of seventh- and eighth-grade junior high school students in a stable middle class community, located in a southwestern suburb of Chicago. Reading comprehension difficulties were documented through data obtained from standardized tests, text- and teacher-made comprehension assessments, and student/teacher surveys. Analysis of probable cause data revealed that students' lack of skills may be related to cultural diversity, a decrease in funding, increased mobility, a growing gang influence, a decline in the valuing of reading, shifts in motivation and goals, school attendance, and a lack of prior knowledge. A review of solution strategies suggested by knowledgeable others, combined with an analysis of the problem setting, resulted in the selection of three major categories of intervention: the use of higher order questioning techniques, the establishment of journal writing, and the use of graphic organizers to develop higher order thinking skills. The intervention proved successful as evidenced by test results. Posttest scores demonstrated measurable growth in reading comprehension for all three groups. (Contains 8 tables, 6 figures, and 41 references; 20 appendixes are attached, including surveys, webs, charts, and diagrams.) (Author/CR)

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ED 398 538

USING HIGHER ORDER THINKING SKILLS

TO IMPROVE READING COMPREHENSION

by

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Field-Based Master's Program

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Action Research Project
Site: Tinley Park, Illinois
Submitted: September, 1995

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Abstract

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Date: April 30, 1996

Title: Using Higher Order Thinking Skills To Improve Reading Comprehension

This report describes a program for using higher order thinking skills to improve reading comprehension. The targeted population consists of seventh and eighth grade junior high school students in a stable, middle class community, located in a southwestern suburb of Chicago. Reading comprehension difficulties were documented through data obtained from standardized tests, text and teacher made comprehension assessments, and student/teacher surveys.

Analysis of probable cause data revealed that students lack of skills may be related to cultural diversity, a decrease in funding, increased mobility, a growing gang influence, a decline in the valuing of reading, shifts in motivation and goals, school attendance, and a lack of prior knowledge.

A review of solution strategies suggested by knowledgeable others, combined with an analysis of the problem setting, resulted in the selection of three major categories of intervention: the use of higher order questioning techniques, the establishment of journal writing, and the use of graphic organizers to develop higher order thinking skills.

The intervention proved successful as evidenced by test results. Posttest scores demonstrated measurable growth in reading comprehension for all three groups.

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Chapter 1

PROBLEM STATEMENT AND CONTEXT

General Statement of Problem

The targeted group of seventh and eighth graders exhibit inadequate skills in the area of reading comprehension resulting in poor academic achievement. Evidence for this problem was gathered from standardized test scores, teacher observations, and anecdotal notes.

Immediate Problem Context

The school has a total enrollment of 733 students consisting of sixth, seventh, and eighth graders. The student population, in the school, is made up of various racial-ethnic groups. According to enrollment reports of February 6, 1996, 83.1 percent of the school's population was classified as White. However, within this group we have many students with Middle Eastern backgrounds (Palestinian, Jordanian, and Egyptian); European backgrounds (Macedonian, Albanian, Bulgarian, Polish and Lithuanian); and

Far Eastern backgrounds (Pakistani and Indian). The school has an Hispanic population of 7.7 percent, an African-American population of 4.6 percent, an Asian/Pacific Islander population of 3.8 percent, and a Native American population of 0.6 percent. Eighteen percent of the students are enrolled in special education classes, with active IEPs. Four percent are currently being serviced under Title I Reading. Sixteen percent of the students are enrolled in the school's gifted program. Finally, there were fifteen non-English speaking students identified as of February, 1996.

The staff consists of 42 classroom teachers, 20 special education teachers and aides, three administrators, one nurse, two social workers, a support staff of seven, and a kitchen crew of six. The classroom teachers have an a age of 16.5 years of experience. Teachers with a bachelor's degree account for 68.4 percent of the faculty with the remaining 31.6 percent having a master's degree or above. One hundred percent of the faculty is White with 36 percent male and 64 percent female. The average age of the faculty is early forties. The teachers' average salary is $38,104 and the average administrator's salary is $61,042. At the school level, the administration consists of a principal and two assistant principals.

The school is located in a middle class southwestern suburb of Chicago, Illinois. It has 27 regular classrooms and 11 special purpose classrooms, all at ground level, which include the following: two art rooms, four science labs, a learning resource center, a math lab, a reading resource center, and a combination music/chorus room. In addition the building has two gyms, one of which has a wooden floor and bleachers for spectators, locker rooms, storage for equipment, and office space. There is also a Media Center and a cafeteria. The grounds include a large blacktop area and an athletic field.

A number of programs are available to the students. Academic programs include: language arts, math, physical education and health, biological and physical sciences, social science, fine arts, computers, Title I Reading, math lab, English as a Second Language (ESL), and programs for gifted students in English, reading, math, and science. A number of extra curricular activities are available to the students. Girls may join basketball, volleyball, and softball. Boys may participate in volleyball and basketball. For all students there is band, (which also offers a trip), chorus, dance club, Socrates (a peer tutoring program), declamation, yearbook, cross country, track, open gym, newspaper, student council, spirit club, math team, and after

school study sessions. French and Spanish are offered before and after school. For sixth grade students only, there is a study skills session held before school two mornings a week; an outdoor education trip is offered in the fall. A special trip for seventh graders is to Mammoth Cave in Kentucky. The eighth graders have the opportunity to go to Washington, DC during spring break and to Great America in Gurnee, Illinois at the end of the year. The National Junior Honor Society is open to seventh and eighth grade students who meet certain scholastic requirements. In addition, some of the students are involved in the Dorn Assistant Program in which they are bused to the district's Primary Center once a week to help the teachers and the children.

The promotion-retention policy for the junior high states that "students who receive one cumulative failing grade in any of the major areas or two cumulative failing grades in the minor areas will possibly not be promoted to the succeeding grade level." Students may go to summer school to make up a failing grade unless they have failed two major subjects and one minor.

The Surrounding Community

The school is located in a southwestern suburb of Chicago. Portions of three neighboring suburbs feed into the school district. Community A, which

covers 3 3/4 square miles, has a population of 13,000, Community B, which covers 2 1/2 square miles, has a population of 17,803, and Community C, of which we serve 1/2 square mile, has a total population of 14,402. Within the three communities there are several ethnic groups. The majority is White making up 91.9 percent of the population (which includes a large Middle Eastern community), 2.1 percent is African-American, 0.2 percent is Native American, 2.0 percent is Asian/Pacific Islander, 3.2 percent is Hispanic, and 0.6 percent is listed as other, on the census. The three neighboring communities are served by several religious centers which include an Islamic Center/Mosque, (which serves over 50,000 people from the southwestern suburbs), a Greek Orthodox church, two Roman Catholic churches (one of which has an attached elementary school for grades kindergarten through eighth grade and has an enrollment of 514 students), and six Protestant churches.

The majority of all three communities is made up of single family homes with some condos, townhouses, and rental units. The housing costs vary within and among the three areas served. Community A's homes range in price from $100,000 to $600,000 with an average price of $155,000. Rental units range in price from $450 to $700 for a two bedroom unit with

the average rent being $550. Community B's homes range in price from $100,000 to $600,000 with an average price of $165,000. Rental units, (approximately 850), vary in price from $500 to $850 for a two bedroom unit with the average rent being $625. Community C's homes range in price from $90,000 to $200,000 with an average price of $150,000. There are no rental units in Community C, however, there is a large trailer park with 900 units. There is no subsidized housing in any of the three suburbs. The property tax in Community A ranges from $900 to $10,000, for Community B from $900 to $12,000, and for Community C $850 to $2,300. There is very little construction going on presently in the three communities. The bulk of Community A was built between 1965-1970 with only six percent of the area being further developed since 1990. The bulk of Community B was built between 1969-1980. Community C was developed in the early 1960's. The housing turnover rate is presently 16-17 percent. The per capita income of the communities is $43,390 with a median household income of $38,137. All three communities have many small businesses but no major industries. Community B has a regional community college within its borders.

This particular school is the only junior high school (grades six through eight) in the district, which also has two buildings for grades two through five

and a Primary Center for kindergarten through first. Each school is within a mile of the other and serves three neighboring suburbs. The total district enrollment is 2,377 pupils with 16.9 percent classified as low income and 3.6 percent classified as limited English proficient. The average attendance rate is 95.3 percent with a chronic truancy rate of 0.10 percent. The student mobility rate is 15.8 percent. At the district level, there are two administrators: a superintendent and an assistant superintendent . In addition there is a Board of Education consisting of seven elected positions. There are 108 teachers in the district and an average class size of 23-24 pupils. Ninety-nine and five tenths percent of the teachers are White with 0.5 percent being Asian/Pacific Islander. Sixteen and seven tenths percent of the teachers are male and 83.3 percent are female. The pupil to teacher ratio is 20 to 1 and the average operating expenditure per pupil is $5,245. The total expenditures for the district are broken into the following categories: 70.5 percent for education, 6.8 percent for operations and maintenance, 4.9 percent for transportation, and 17.8 percent spread among other related school business funds. Services for district students include counseling/social work, speech, physical therapy, psychological testing and evaluations.

There are several issues of concern that exist in the community. The first is money for schools. Previously, the community successfully passed a referendum in 1976. But in the early 1980's, with funding cuts and increasing costs, the district decided to go to the community for help again. From November, 1982 to April, 1993 the community voted "no" eleven times to a tax increase. Finally, in November, 1993, the referendum was passed. Currently the 1995 tax cap law is partially overriding this vote. The school district has a projected loss for the next two years of $1,664,423.00 due to the tax cap. When the referendum failed by only ten votes five years ago, the Better Education Foundation was formed. This organization is made up of interested community members, parents, and teachers to help raise money for the schools. Another area of concern in the community is the growing influence of street gangs. Schools, parents and the local police are working together to try and keep gang influence to a minimum.

Regional and National Context of Problem

Reading comprehension has been a major news issue for a number of years, especially since 1985 when Becoming a Nation of Readers: The Report of the Commission on Reading became a major topic in the news. Ten years later it is still a major concern for a majority of people in the nation. Evidence

for this can be seen in the increased emphasis on testing students. Illinois began the process of statewide testing for reading in 1985 and now the testing has spread across the curriculum. Scores on these tests have provided many politicians with a major campaign issue that will always get the attention of the public. State report cards, which are printed in most major city newspapers as well as local ones, are topics of discussion among the general public, which seems to be especially concerned with reading and math. People who are involved in businesses across the nation are also voicing their concerns about the lack of reading skills they see in people who are applying for jobs (Harris & Sipay, 1985). Most of the general public believes that testing is the only way to find out what knowledge a student has.

In the ever changing technological world in which today's students are being educated, reading comprehension has become a major necessity. According to Bormuth (cited in Harris, 1985),

> The most frequently cited complaint of employers concerns the reading and writing abilities of white-collar workers. But what has been overlooked is that the percentage of the work force who are white-collar workers is increasing (e.g., it rose from 36% in 1946 to 48% in 1974).

In order to fill many of these positions, people with lower intellectual abilities than was formerly the case have had to be hired. (p. 3)

During the early part of this century, schooling was not required, but there was a large number of jobs open to those who had little or no education. Today the opposite is true. As technology advances, manual labor tasks are either disappearing or are requiring the ability to read and understand the instructional manuals that are a necessary part of the job. Aaron (1990) stated that, based on an editorial he read, by the year 2000 many jobs will need at least a second-year college reading level because of their complexity.

As solutions have been sought to address this problem, many trends are appearing in education today. Smith (1989, 1990) listed the following trends: integrated language activities, individualism, literacy, (which includes literature, writing, integrated Language Arts and whole language), and collaborative learning. He also stated that there have been changes in the type of research being reported such as anecdotal studies, teacher testimonials, and teacher-as-researcher. Chall (cited in Carey, 1986) recognized the formation of the following: National Right to Read Effort, Reading Is Fundamental (RIF), the U.S. Office of Education's Basic Skills Program, Sesame Street, The Electric Company, Head Start, Follow Through, the

Elementary and Secondary Education Act (including Chapters I and III), and a host of other programs designed to eliminate the stigma of illiteracy. Textbooks are also being revised in light of these trends (Beck, McKeown & Worthy, 1995). Illinois now has the School Improvement Plan (SIP) which is mandated by law for all public schools in the state with the exception of the Chicago schools. The state also mandates the Illinois Goals Assessment Program (IGAP) tests.

Locally, not only the reading department but other departments in the targeted school have become concerned about student's reading comprehension skills. Teachers are seeing a number of students who either cannot comprehend what they read, or in some cases, cannot even read the textbooks. Griffin and Olson (1992) stated that extensive research has indicated the importance of phonemic awareness as a prerequisite for understanding the alphabet principle, namely that letters stand for the sounds in spoken words. Since reading comprehension is such a necessary skill for all subject areas, this study will address possible causes and strategies to improve reading comprehension skills in the targeted school.

Chapter 2

PROBLEM EVIDENCE AND PROBABLE CAUSE

Problem Evidence

In order to document the existence of the problem, the results of the Iowa Test of Basic Skills (ITBS), reading subtest, from the fall of 1994, were reviewed. In addition, a teacher survey was distributed the first week of school, and the Nelson Reading Skills Test, Form 3, Level C was given to the targeted group at the beginning of September. The teacher surveys (Appendix A) consisted of three statements and were given to all teachers in the targeted school. Of the 46 surveys distributed, 35 were returned. The accompanying chart (Table 1) shows the distribution of responses. Question one asked whether or not Silent Sustained Reading (SSR) helped to improve student comprehension. Sixty-three percent of the teachers responding agreed or strongly agreed that SSR helps to improve students' comprehension, while only 29 percent disagreed or strongly disagreed. In response to the second statement concerning whether today's students have more difficulty

Teacher Survey Results

Statement	strongly agree	agree	disagree	strongly disagree
1. SSR helpful in improving reading comprehension	4	18	9	1
2. Difficulty in comprehending text material	10	18	5	0
3. Student responses show evidence of thinking	1	9	17	5

N=number of teacher responses

Table 1

comprehending basic text material, 80 percent agreed or strongly agreed, while only 14 percent disagreed; no one strongly disagreed with that statement. The last question addressed whether students show evidence of thinking before giving written or verbal responses to questions. Twenty-nine percent of the teachers agreed and strongly agreed with that statement, while 63 percent disagreed or strongly disagreed with it. Not all teachers answered every question which explains the variations in the percentages.

After reviewing the teacher surveys, the percentage of responses that agreed or strongly agreed to the first question about SSR was somewhat lower than expected. The 80 percent who agreed or strongly agreed with statement two confirmed what had been heard as a common concern among many of the teachers, that comprehending text material was difficult for today's students. Responses to the final question were somewhat surprising, since the majority of teachers felt that students did show evidence of thinking before answering. This might be due to the teachers being unclear as to exactly what the question was asking. However, the survey did prove valuable in providing information about teachers' concerns regarding comprehension.

Three separate groups make up the targeted group. Class A, a seventh grade literature class, and Class C, an eighth grade literature class, range in

ability from remedial to high average. Class B is a seventh grade remedial science class. Table 2 shows the results of the ITBS reading subtest. Seventeen percent of Class A scored below the 50th percentile; 88 percent of Class B and 45 percent of Class C scored below the 50th percentile. Scores were not available for four of the seventh grade students and two of the eighth grade students.

The Nelson Reading Skills Test was used as a pretest to assess the extent of the problem in the targeted group. Table 3 shows the results of the Word Meaning subtest. Forty-two percent of Class A scored below the 50th percentile; Class B had 84 percent and Class C had 58 percent below the 50th percentile. Table 4 shows the results of the Nelson comprehension subtest. Fifty-eight percent of Class A scored below the 50th percentile; 89 percent of Class B and 63 percent of Class C scored below the 50th percentile.

After looking at the evidence from the teacher surveys and the test results, it appears that many of the students in the targeted group are lacking the skills to comprehend written materials. The Nelson Test results specifically showed that more than half of each targeted class was below the 50th percentile in comprehension; therefore, this area definitely needs to be addressed. Since this test was given during the third week of school, the

Iowa Test of Basic Reading Skills--Total Reading

Percentile Ranking	Class A	Class B	Class C
0-10	0	1	3
11-20	0	6	4
21-30	1	4	3
31-40	1	1	2
41-50	1	1	3
51-60	6	0	4
61-70	4	1	1
71-80	4	0	0
81-90	0	0	2
91-100	1	0	0

N=number of students scoring in that range

Table 2

The Nelson Reading Skills Test Word Meaning

Percentile Ranking	Class A	Class B	Class C
0-10	0	4	1
11-20	1	3	1
21-30	0	0	8
31-40	3	2	1
41-50	3	5	2
51-60	3	2	2
61-70	3	0	6
71-80	1	0	0
81-90	2	1	2
91-100	1	0	0

N=number of students scoring in that range

Table 3

The Nelson Reading Skills Test Comprehension

Percentile Ranking	Class A	Class B	Class C
0-10	4	3	2
11-20	0	4	4
21-30	1	4	3
31-40	3	2	2
41-50	2	2	3
51-60	0	0	6
61-70	1	2	1
71-80	4	0	0
81-90	2	0	2
91-100	0	0	0

N=number of students scoring in that range

Table 4

timing may be part of the reason that a large number of students scored poorly.

Probable Causes

There are a number of factors that are influencing students' poor reading comprehension. One factor is an increasingly diverse student population. As stated in Chapter 1, the State Report Card shows that 88 percent of the student population is White. However, the data are misleading as five percent of that number consists of students with limited English proficiency, primarily from the Middle East.

Another factor is the student mobility rate. As per the State Report Card, an average of 25 students per grade level enroll or transfer out during the course of the school year.

A third factor, also documented on the State Report Card, is the operating expenditure per pupil. This amount is currently $675 below the state average, and this is before the 1995 tax cap is implemented.

A final factor is the reading habits and motivation of the students. A Reading Experiences Inventory (Appendix B), which asked students about their reading habits and preferences, was given to the targeted group in early

September. The results can be seen in Table 5. Ninety-seven percent of the students completed the survey. Each statement was marked *never*, *sometimes*, or *often*. The following statements reflect the results of the survey. Seventy-three percent of the group enjoyed reading *sometimes*, while five percent answered *never*. Only seven percent of the students said that they *never* found reading easy, while all the others answered *sometimes* or *often*. Sixty percent of the targeted group read the newspaper *sometimes*, whereas, twelve percent never read books or magazines for enjoyment. Surprisingly, nearly half of the students never read comic books for enjoyment. Only eight percent of the group never read books, magazines, or other materials to get information. Forty-eight percent of the students never use the school library for a purpose other than class assignments, while 42 percent sometimes used the library for more than class assignments. The public library is used by 65 percent of the students *sometimes*. Only eight percent often talked with their families about books they had read; whereas, 65 percent never discussed any books they read with their families. Fifty-three percent of the group said that television programs and movies gave them ideas about things to read.

Reading Experiences Inventory

Section and Question A	Never	Sometimes	Often
1. Enjoy reading	3	44	13
2. Find reading easy	4	31	25
3. Find reading a bother	19	32	9
4. Read the newspaper	16	36	8
5. Read books for enjoyment	8	32	20
6. Read magazines for enjoyment	6	18	36
7. Read comic books for enjoyment	28	16	16
8. Read materials for information	5	39	16
9. Use school library for more than assignments	29	25	6
10. Talk with family about books read	41	14	5
11. Go to public library	4	39	17
12. TV and movies give ideas for things to read	15	31	14
Types of Stories B	**Like very much**	**Like Somewhat**	**Dislike**
1. Real events in the past	10	36	14
2. Life in other countries	8	35	17
3. Lives of real people	20	22	18
4. Science and nature	19	27	14

Table 5

5. Record books	10	29	21
6. Sports	28	18	14
7. Adventure	36	20	4
8. Deals with feelings	10	23	27
9. Mystery	39	19	2
10. Science fiction	27	16	17
11. Humor	34	21	5
12. Fantasy	25	27	8
13. Plays	18	24	18
14. Poems	16	25	19

C	None	1-30 Min.	30-60 Min.	More than one hour
1. Time spent reading daily for other than school work	6	39	11	4

	None	1-2	3-5	More than 5
2. Number of books read in one month	5	33	19	3

N=number of students responding

Table 5 (continued)

In section B of the survey, students were asked to tell how they felt about several kinds of stories. The choices were marked using the following: *a. like very much*, *b. like somewhat*, and *c. dislike*. Mystery, adventure, and humor stories were all marked ***like very much*** by more than 50 percent of the targeted group, while only eight percent or less marked ***dislike*** for any of the three. Other topics which 42-45 percent of the students marked ***like very much*** were science fiction, sports, and fantasy. Stories that dealt with feelings were disliked the most with 45 percent of the students marking that answer; while 23-35 percent of the group marked ***dislike*** for other kinds of stories such as poems, record books, lives of real people, and plays. The kinds of stories liked most by the students were not nearly as surprising as the types of stories the students disliked.

A large number of students (65 percent), as reflected in section C, spent from one to 30 minutes per day reading material for purposes other than school, and ten percent spent no time at all reading materials unrelated to school. Eight percent read no books at all in one month; 55 percent read from one to two books in one month; 32 percent read from three to five books in one month; and five percent read more than five books in a month.

The last section of the student survey asked a series of questions which required the students' own written answers. A summary of the responses follows. The newspaper sections that most students usually read were the comics; weather came in second. A number of books were listed as favorites, but Where the Red Fern Grows came in first with the most votes. R.L. Stine was the students' favorite author followed by Stephen King. When the students were asked about the best book read in the last year, the only book mentioned more than twice was Hatchet. A long list of books was compiled when students were asked about other books they had read, but the Goosebumps books were referred to the most.

A large number of students stated that most of their reading materials came from either the school or local library. Only six of the 60 students completing the survey thought that reading was boring. Most of the others thought that reading was fun or at least okay. When asked about why they usually read books, only thirteen read because the assignment was mandatory. The other 47 read for a variety of reasons such as to pass the time, for enjoyment, or for something to do. The books, magazines, or comic books that students had in their homes were quite varied, as were their requests for the kinds of materials they would like to see more of in the

library. In conclusion, this survey provided much information about the students reading habits, as well as their likes and dislikes.

Within the targeted school there is evidence of trends reported nationally that are causing a population of alliterate students. According to Mullis and Jenkins (cited in Cramer, 1993), a classroom teacher today faces a greater problem in working with students who can not read or have difficulty in doing so. An even greater problem is working with students who can read, but for some reason choose not to use that skill. This in turn impacts students' comprehension skills. A number of causes have been suggested as reasons for lower comprehension. In 1981, Guthrie (cited in Harris, 1985) stated that compared to other industrialized nations, Americans read less. The Albany Times Union (cited in Harris, 1985) stated that only 56 percent of the Americans surveyed in one study claimed to have read a book in the past six months, a figure that has remained fairly stable since 1978. Becoming a Nation of Readers states the following as reasons for decreased reading scores:

> Increases in TV viewing, changes in the size of families and spacing of children, shifts in young people's motivations and life goals, and the

fact that larger numbers of youth from less advantaged families have been staying in school and taking the tests. (p. 2)

Harneschfeger and Wiley (cited in Harris, 1985) said that although there is insufficient evidence to determine exact causes, a decrease in average daily attendance, teenage addiction to alcohol and drugs, and changing social attitudes and trends also impact these scores. Many of today's adolescents seem to believe that they will emerge from school into an electronic world in which little reading and less writing will be required of them (Thomas & Moorman, cited in Cramer, 1993).

Along with poor reading habits and motivation, students with limited English proficiency are impacting the targeted school. Holmes and Moulton (1994) stated that educators assumed if students were literate in their native language, they would easily become literate in a second language. However, one thing can't be disputed: cultural background influences what and how a student learns (Berliner & Cassanova, 1993). Students who enter school at the junior high level with a limited or non-existent command of English are at a definite disadvantage when attempting to comprehend written materials in class.

Based on the evidence collected from the site, the following causes have been researched and documented. Students of different cultural backgrounds, lack of prior knowledge, an increasing mobility rate, lack of adequate funding, and a shift in reading habits and motivation puts the students at the targeted school at a disadvantage.

Chapter 3

THE SOLUTION STRATEGY

Review of the Literature

After looking at the problem area in the targeted school, using higher order thinking skills was deemed critical for reading comprehension. When working with today's students, styles of thinking and learning are every bit as important as levels of ability (Sternberg, 1990). In the late 1980's, the National Assessment of Educational Progress concluded that critical thinking and strategies that build student interpretive and reasoning abilities need to be a part of reading instruction (Block, 1993). In 1987, Ericson, Hubbler, Bean, Smith, and McKenzie stated that the best time to help students learn strategies for critical reading comprehension is at the junior high level, as it will form a basis for their success at higher levels of education.

The ability to read and comprehend is a necessary life skill that can direct future opportunities and eventual personal successes. This skill incorporates not only word calling but also includes, more importantly,

whether or not the reader derives meaning from the printed word. A number of our students are so concerned with reading accuracy that they forget the real purpose is comprehension. According to Harris and Sipay (1985), lack of prior knowledge may be a contributing factor when word recognition is automatic but comprehension is weak. In order to understand written material, readers must use information from the text along with the knowledge they possess to produce meaning (Becoming a Nation of Readers, 1985, What Works, 1986). Many students in the targeted school show evidence of a lack of prior knowledge in content areas as well as in literature classes. Even though 88.5 percent of the school's population was classified as White, within this group are students with Middle Eastern, Far Eastern, and European backgrounds. In 1985, Harris and Sipay stated that prior knowledge is conditioned by cultural factors. One possible solution would be to incorporate a KWL chart. Using this method, students divide a paper into three columns with the following headings: what they know, what they want to know, and what they learned about the topic. The first two columns are completed prior to reading material pertaining to the subject. The last column is completed after the material has been read and discussed. According to Berliner and Cassanova, 1993, some specific prior knowledge can be taught

by providing a schema to facilitate the organization of new ideas. This in turn helps build relationships between old and new information especially in regard to content areas.

Journals are another useful tool in aiding comprehension, as they can be used for a variety of purposes. In 1992, Hancock (cited in Hancock, 1993) stated, "A response journal not only provides the freedom to focus on the expression of personal thoughts, but it elevates reading to an active process of personal meaning-making," (p. 466). Students have an opportunity to practice different types of writing in a less structured setting while being aware of their audience. Entries made in a journal can help students make a connection between what they know and what they learn as they read. Wells (1992-1993) noticed that when students wrote about a novel that they had read and they knew one of their peers would read what they had written, the journal entry was more like an abstract of that novel.

According to Brian (cited in Hamann, 1991), students responded to comprehension questions in a more thoughtful manner when writing about personal experiences relevant to the topic as a prereading activity. It also aided in student analyses of the characters. Journals enable students to have conversations with themselves, fellow students, and the teacher. As students

reflect upon their own lives, they are better able to relate to the text that they are reading. Fulwiler (cited in Fusco & Fountain, 1992) said, "When people write about something, they learn it better. That, in a nutshell, is the idea behind asking students to keep journals." (p. 247)

Another technique that, when coupled with reflective journals, enables students to assess their own skills and determine how they can improve, is cooperative groups (Johnson & Johnson, 1992). These groups afford a number of benefits to students of all levels and abilities. In 1993, Maria and Hathaway stated that cooperative groups not only increase a person's awareness, but they make a person more open to change. New students adjust to their surroundings faster when they are part of a small group and must be included in the conversation. According to Larson and Dansereau (1986), cooperative grouping can provide more time for individual instruction and diagnosis by the teacher because the teacher is freed from the normal teaching activities during that time. Students working in cooperative groups can maximize their own learning as well as other students' learning (Bellanca & Fogarty, 1992). The need to respect and appreciate fellow students has never been greater than it is today.

Since a main purpose of education is not to fill students' minds with facts, but to teach them to think and think for themselves (Hutchins cited in Bellanca & Fogarty,1993), the use of higher order thinking skills and graphic organizers makes more sense than ever in today's classroom. Graphic organizers are visual representations of a variety of information. They can include, but are not limited to, providing additional content, elaborating on a specific concept, reviewing facts and charting prior knowledge, and comparing and contrasting data. According to Braselton and Decker (1994), the strength of a graphic organizer lies in its ability to visually relate elements. This requires students to slow down and think through a problem. Students see visual organization of the process of problem solving and are required to express their understanding of it. This, in turn, helps students to develop a schemata for problem solving. Some commonly used effective graphic organizers are webs (Sampson, Sampson & Linek, 1994-1995), Venn diagrams (Burke, 1994), concept maps (Reutzel, 1984), charts (McTighe & Lyman, 1992), and variations thereof that make ideas visible (Gillespie, 1993).

Using questioning strategies is another technique that can help students prepare for reading and understanding the text as it is being read. Andre and

Anderson (1978-1979) stated that the use of questioning while studying was particularly beneficial to low verbal ability students, because this group's usual study behaviors were less adequate; making use of an efficient study technique affects their criterion test performance. A variety of questioning techniques were reviewed. The E.R.I.C.A. model (Effective Reading In Content Areas) is a study process which is applied directly to a content area and is intended to be used in small group discussions (Eden, 1991). Another model used in conjunction with E.R.I.C.A. is C.L.U.E.S. (Comprehending by Learning to Use Effective Strategies), which is a method for obtaining information that is used with younger students. The next strategy is F.L.I.P. (Friendliness-Language-Interest-Prior Knowledge), a guide for students to use in evaluating a reading assignment (Schumm & Mangrum, 1991). In 1989, Jacobson proposed a model called RESPONSE which is a study technique that provides an opportunity for students and the classroom teacher to interact while combining reading, writing, and reasoning (Farris, Fuhler & Ginejko, 1991). A program called S.A.I.L. (Students Achieving Independent Learning) emphasizes the whole reading process while helping students become independent learners and readers as quickly as possible (Bergman & Schuder, 1992-1993). G.R.I.P. (Generative Reciprocal Inference Procedure),

by Hollingsworth and Reutzel (1993), involves the use of five strategies for teaching students how to draw inferences. In 1991, Nolan conducted a study which combined two cognitive strategies - self-questioning and prediction. The study involved the combining of these two strategies and using them as a single intervention.

All of the above were determined to be unsuitable for our targeted group as they specifically involved only content areas, were for use with younger children, or involved many hours of teacher training before implementation.

The procedures best suited to meet the needs of our targeted group include the following questioning techniques. Q.A.R. (Question-Answer-Relationship) teaches students that questions do not exist in isolation but are related to the appropriate answer (Raphael, 1984). Josel's (1990) technique, Taking It All Down Doubly, is a form of two column note-taking. D.R.T.A. (Directed Reading-Thinking Activities) involves the use of comprehension monitoring (Haggard, 1985).

Based on the large number of methods that were reviewed, making connections to improve reading comprehension is a national concern. Becoming a Nation of Readers states that when verified practices of the best

teachers in the best schools can be introduced throughout the country, America will become a nation of readers. In conclusion, Bellanca and Fogarty (1991) state:

> The schoolhouse is not a factory. It is an artisan's workshop in which the master nourishes and enriches the apprentices' talents. The apprentices learn not to be tested, but to develop knowledge, skill, and talent that will serve them well when they step into their own world of work. (p. xiii)

Project Outcomes and Solution Components

As a result of using techniques that foster higher order thinking skills (HOTS), during the period of September, 1995 to February, 1996, the seventh and eighth grade students from the targeted groups will increase their reading comprehension as measured by the Nelson Reading Skills Test and the chapter/story comprehension questions.

In order to accomplish the teminal objective, the following processes are necessary:

1. A number of questioning strategies that foster comprehension skills will be implemented.

2. A variety of journal entries that address comprehension will be used in both reading and science.

3. Graphic organizers will be used to reflect prior knowledge and develop higher order thinking skills (HOTS).

Action Plan

One of the following solution strategies will be implemented at least once per week.

I. Questioning Techniques is a strategy that can be implemented during or after a reading selection.

A. QAR - question-answer relationship.

The philosophy behind QAR is that an answer to a question is somehow related to that question. There are three terms that are used to describe this relationship: RIGHT THERE, THINK AND SEARCH, and ON MY OWN.

The RIGHT THERE QAR means the words that are used to make up the question and the words that answer that question are RIGHT THERE in the text. An example of this would be:

> Robbie wore a red scarf to school today. It was a present from his grandmother. RIGHT THERE QAR - What color scarf did Robbie wear to school today? (red)

The THINK AND SEARCH QAR is when the words used in the question and the words that answer the question are different. The student must think and search for the answer. An example of this would be:

> THINK AND SEARCH QAR - Where did Robbie get the scarf? (from his grandmother)

The ON MY OWN QAR is an answer that cannot be found in the text. A student must use what is already known to answer the question. This type of QAR can have more than one acceptable answer. An example of this would be:

> ON MY OWN QAR - Why did Robbie wear a scarf to school? (It was cool, it was winter, or it was windy.)

Students will be taught how to identify and use QARs at the beginning of the school year. The teacher will use the unit for this strategy developed by the Center of Reading at the University of Illinois to familiarize the students with the terminology and concepts of this strategy.

B. "Taking It All Down Doubly" is a method of recalling and synthesizing

the main points of a selection by utilizing two-column notetaking. Students are instructed to preview a selection, first noting maps, charts, introductory and summarizing paragraphs. Next, students are shown how to turn statements about the selection into questions using the words who, what, when, where, why, and how. Finally, the teacher demonstrates how to fold the notebook paper in half so there are two columns of the same size. Working with one section at a time, the students turn all headings and important terms into questions and write them in the left column. After recording the questions, the section is read. As answers to the questions are discovered, they are recorded in the right-hand column opposite the question becoming the student's personal study guide.

C. DRTA (Directed Reading-Thinking Activities) will be used while the students are reading a selection together. The teacher will use questions provided by the publisher in the manual, or make up questions about the selection. The teacher will stop the reading at certain intervals, ask the questions, and discuss the answers as a group activity.

II. Journals are another strategy that will be used as a prereading, during reading, or postreading activity.

A. A double entry journal requires students to make an initial observation and write about it in a journal. After completing the activity, students are to write a second entry which reflects on what has been observed/learned. (Appendix C)

B. Stem statements are partial sentences which motivate students to write a thought or two in their journals. These entries may include making predictions, explanations, key ideas, processing information, making connections, or reflecting on what they have learned. Some examples of this are: "An interesting part was....., I predict....., A connecting idea is....., How.....?, or Why.....?" (Appendix D)

C. Reflective lesson logs will be used to aid students in the retention of key ideas, to list questions students may want answered, to list information learned during group discussions, or for connecting other ideas with the new material. These logs require longer written entries since the students will need to respond to these sections in greater detail. (Appendices E, F, G)

III. Graphic organizers are a third strategy that will be implemented as a prereading, during reading, or a postreading activity. In addition, these strategies can be used by individual students as well as cooperative groups.

A. Webs/Maps are visual/pictorial representation of an idea, a character, a concept, or terminology. An example of this is a character web. This would consist of writing a character's name and then identifying certain traits of that character using the selection. Included would be how a character looks, how he feels, his actions, and what he says. (Appendices H, I, J)

B. Charts are organized so that pieces of information are placed in columns or boxes. An example of this would be a K-W-L chart. The student divides a paper into three columns. In the first column, prior knowledge or what the student knows (K) about the given topic is recorded. In the next column, what the student wants (W) to know about the given topic is listed. After the student reads the selection, the

final column is completed using information that has been learned (L) from the selection. (Appendices K, L, M, N, O, P)

C. Venn Diagrams use intersecting circles to compare and contrast ideas, characters, concepts, or terminology. An example of this could use the settings from two stories. In each of two overlapping circles, the students write how the settings are different. Where the circles intersect, the students write how the settings are alike. (Appendix.Q)

Methods of Assessment

A pretest for determining the present level of reading comprehension in the targeted group was administered prior to instruction of specific strategies. Upon completion of the various strategies , a posttest similar to the pretest will be given. The pre- and posttest results will be compared to determine the amount of change that has occurred.

Throughout the time period, students will be using the possible solution strategies in a random mix, and will turn in samples of these to document competence and familiarity. In addition, the students will be answering comprehension questions that will be scored using a teacher-made rubric

(Appendix R). The results will be recorded on a student rubric score sheet (Appendix S).

Chapter 4

PROJECT RESULTS

Historical Description of Intervention

The objective of this project was to improve reading comprehension using higher order thinking skills. The interventions implemented were questioning strategies, a variety of journal entries, and graphic organizers. They were tied in directly with the curriculum. Student instruction occurred as it applied to the lessons. Class A began using all three types of interventions, but found that graphic organizers and journaling were more appropriate for that group. Since Class C was also a reading class, the strategies were used in a similar manner to Class A. Class B, a science class, began using more graphic organizers, but found that questioning strategies and journaling became the primary interventions used.

Questioning strategies was the first intervention. This involved question-answer relationships (QAR), Taking It All Down Doubly, and Directed Reading-Thinking Activities (DRTA). Several journal formats were used such as stem statements, reflective lesson logs, and double entry. The

third intervention consisted of a variety of graphic organizers that included webs and maps, charts, and Venn diagrams. One of these activities was used at least once per week as a prereading, during reading, or postreading activity, both in cooperative groups as well as individually.

As the year progressed, some modifications to the action plan were made. These included a reporter-recorder journaling technique used in Class B. One student had to tell the story/concept while the other student could only write it. The process reversed and the students compared what was written for accuracy. This particular technique lent itself better to accurately interpreting scientific concepts. Since a number of students in Class B had very poor decoding skills, the QAR strategy was found to take more time than seemed beneficial. The students showed more interest in journaling when using strategies that incorporated verbal skills. As Classes A and C began to use the QAR technique, it became apparent that the strategy did not lend itself to the new reading series as well as anticipated. This series was incorporated as part of the curriculum in the fall of 1995. The type of questions included in the series involved more critical and creative thinking skills. Therefore, journaling and graphic organizers were more appropriate. Nevertheless, teacher observation reflects an increase in the quality of the students' verbal

and written responses. In the fall of 1995, the district dropped the Iowa Test of Basic Skills for the seventh and eighth grade students.

Presentation and Analysis of Results

In order to assess the effects of the interventions on student comprehension, the Nelson Reading Skills Test was used as a pre- and posttest. A comparison of the scores from September and March showed improvement for the majority of students in Classes A, B, and C in both word meaning and comprehension. When comparing the pre- and posttests for the word meaning section, the scores showed the following increases: for Class A, from 59 percent to 88 percent at or above the 50th percentile, for Class B, from 18 percent to 35 percent at or above the 50th percentile, and for Class C, from 43 percent to 49 percent at or above the 50th percentile. It is significant to note that in the fall, Class C had 43 percent of the students below the 30th percentile while in the spring only one percent were below that point. When comparing the pre- and posttest scores for comprehension, Class A had 41 percent at or above the 50th percentile and increased to 66 percent, Class B showed an increase from 12 percent in September to 24 percent in March at or above the 50th percentile, and in Class C, 39 percent scored at or above the

50th percentile in both the fall and spring. Again, it is significant to note that, though the percentages remained the same for Class C, the numbers do not show the growth that occurred at the low end. In the fall, Class C had 39 percent of the students at or below the 30th percentile while in the spring only 22 percent were below that level. In addition, in the fall, only one percent of the students were above the 70th percentile while in the spring the number had increased to 22 percent. Individual results are shown in Tables 6, 7, and 8. This shift in the number of students in the upper percentile rankings for all classes is shown in Figures 1through 6. This overall increase supports the idea that reading comprehension was improved.

After analyzing the data, some of the individual student scores showed a regression which may be due to the following factors. In preparation for the state assessment tests, students spent time working on practice tests in many academic areas during February. The students then took the IGAP Test at the beginning of March. Local assessments for our School Improvement Plan (SIP) have been numerous and ongoing throughout this school year. Since our assessment followed, some of our students may not have taken our test seriously. Another factor that influenced scores was the transfer of students in and out of the three classes. Although data for these students has been

THE NELSON READING SKILLS TEST FORMS 3&4

Class A	Word Meaning		Comprehension	
Percentile Ranking	9-95	3-96	9-95	3-96
0-10	0	0	4	0
11-20	1	1	0	0
21-30	0	0	1	1
31-40	3	1	3	0
41-50	3	3	2	3
51-60	2	1	0	4
61-70	3	2	1	2
71-80	1	4	4	2
81-90	2	4	2	2
91-100	1	1	0	3

Table 6

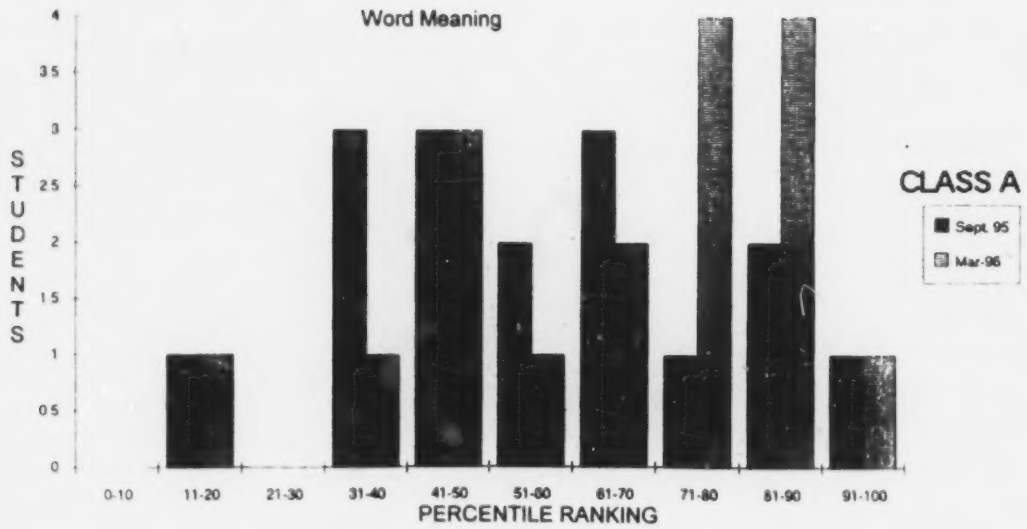

FIGURE 1

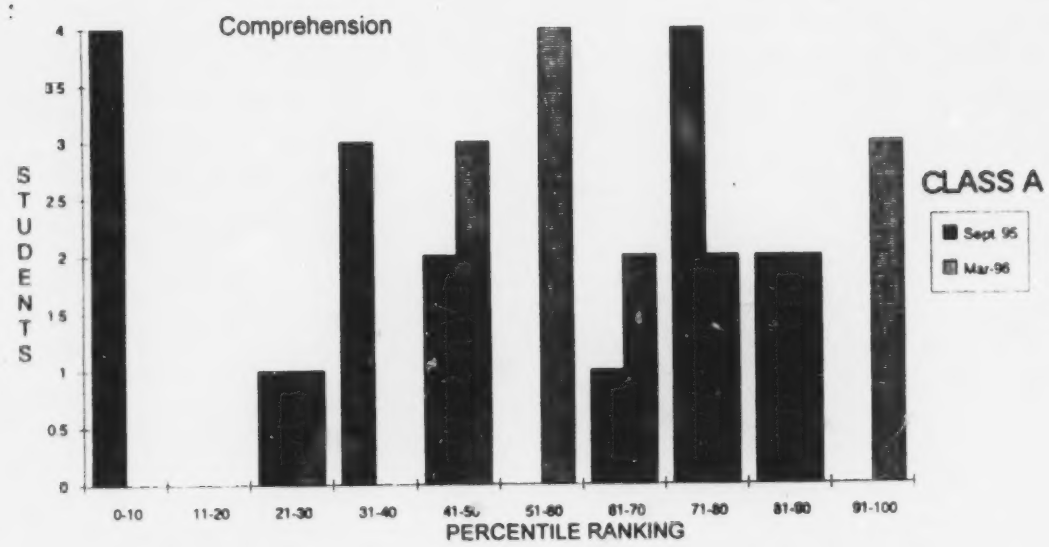

FIGURE 2

THE NELSON READING SKILLS TEST FORMS 3&4

Class B	Word Meaning		Comprehension	
Percentile Ranking	Fall 95	Spring 96	Fall 95	Spring 96
0-10	4	1	3	3
11-20	3	1	4	1
21-30	0	4	4	3
31-40	2	2	2	4
41-50	5	3	2	2
51-60	2	3	0	2
61-70	0	1	2	0
71-80	0	1	0	1
81-90	1	1	0	1
91-100	0	0	0	0

Table 7

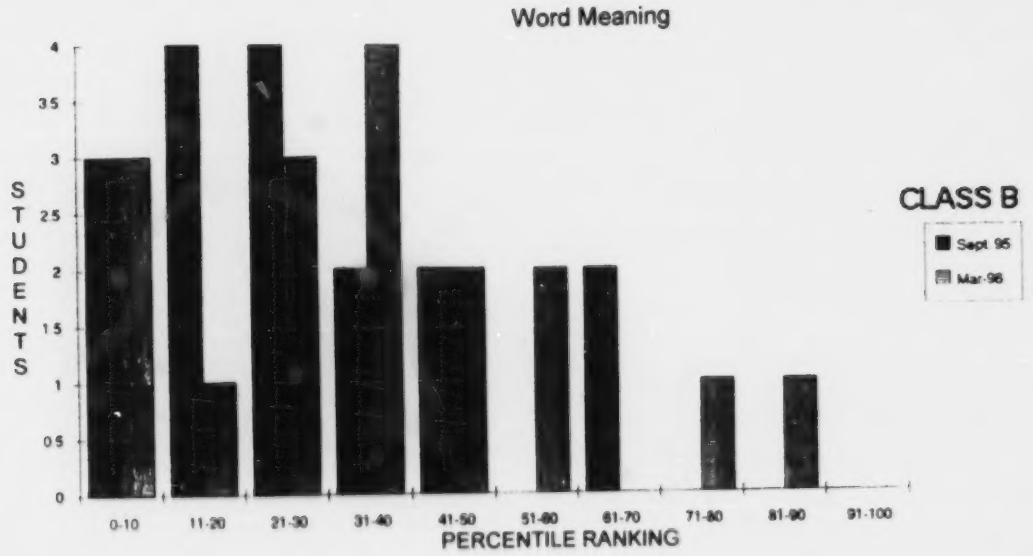

FIGURE 3

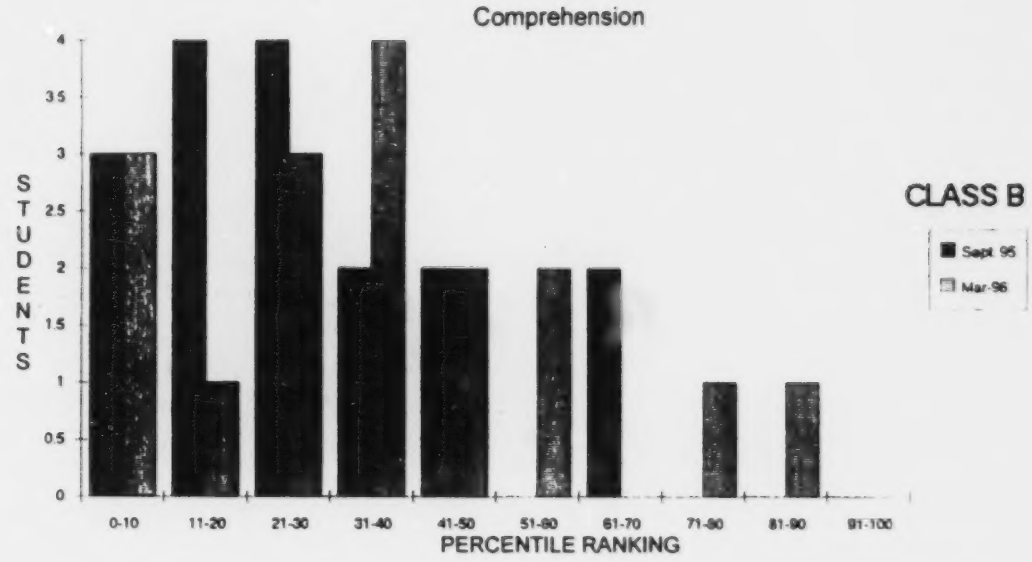

FIGURE 4

THE NELSON READING SKILLS TEST FORMS 3&4

Class C	Word Meaning		Comprehensi
Percentile Ranking	Fall 95	Spring 96	Fall 95
0-10	1	1	2
11-20	1	1	4
21-30	8	1	3
31-40	1	3	2
41-50	2	7	3
51-60	2	3	6
61-70	6	3	1
71-80	0	2	0
81-90	2	3	2
91-100	0	0	0

Table 8

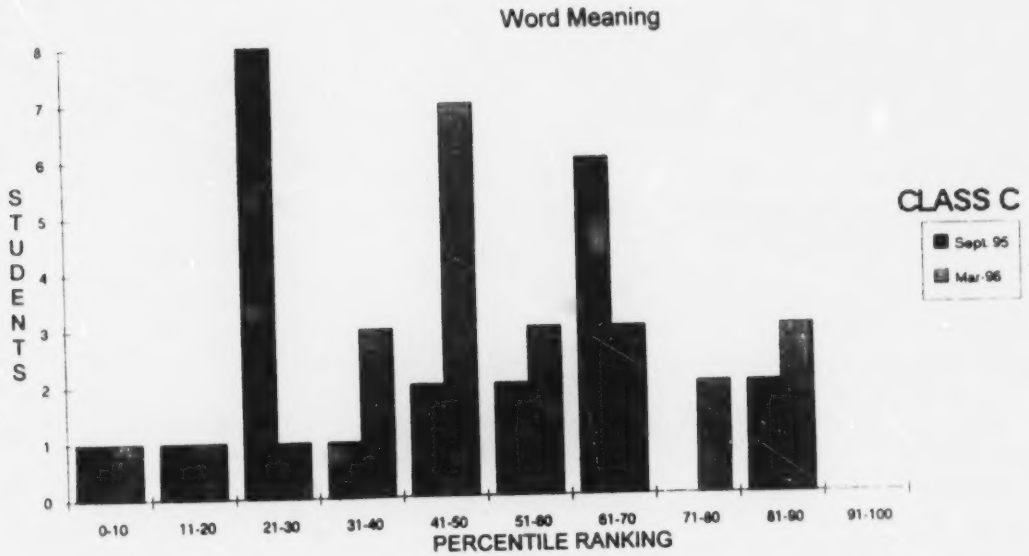

FIGURE 5

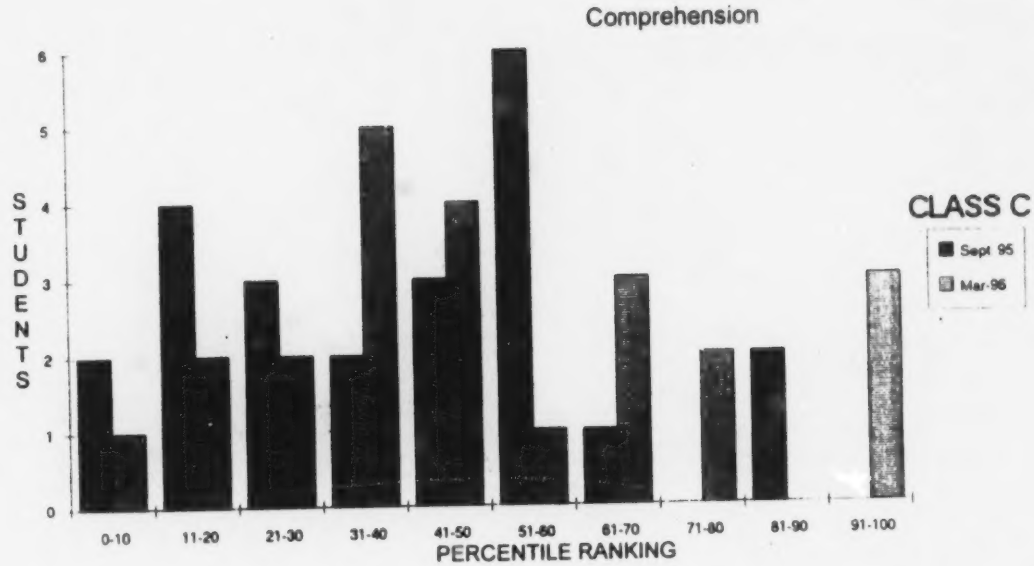

FIGURE 6

deleted from the tables and graphs showing the results of the Nelson Reading Skills Test, it is included in the initial student reading survey results. Class B, in particular, was affected by the addition of five new students during the course of the year. Though their scores on the spring reading test are not reflected in the results, it is interesting to note that only one of the students scored at the 50th percentile while the other four scored below the 20th percentile in both areas. Furthermore, many faculty members have observed a general attitude of indifference throughout the entire eighth grade class. The scores of Class C may reflect this. Another component that impacts our data is the change in the Title I Reading Program. This year Title I Reading was changed from a pull-out (resource) program to an in-class collaborative program. Consequently, students who would have received individual attention in a small group setting are now part of a much larger group. The reading specialist now sees students only once or twice a week instead of every day. This change has a strong impact on all students scoring at the 30th percentile or below on achievement tests. The larger group is affected as well. Finally, the diversity of the student population may also have influenced the test results, as noted in Chapter 1.

Conclusions and Recommendations

Based on the presentation and the analysis of the data on the Nelson Reading Skills Test, the students showed a marked improvement in both word meaning and reading comprehension. It is interesting to note that significant gains for all classes were made both in the top and bottom percentiles. The students, in turn, were encouraged by their success as measured by the results of the test. The comprehension skills learned, both in cooperative groups and individually, appear to have given the students the means to better answer questions. Students spend more time formulating thoughtful answers to questions. Evidence is apparent in other types of class work such as lab reports and book reports. Students time on task increased. The collaborative nature of cooperative groups may have positively affected the test results. Terminology associated with the methods used has become a part of the students' vocabularies.

On the basis of these results, the interventions are recommended as a method to improve reading comprehension. If others plan to implement these interventions, the following should be kept in mind. Each group has its own personality and certain methods work better than others. As curricula change to include more critical and creative thinking skills, certain questioning

techniques, such as QAR, may not apply or may need to be adapted. Since many of the strategies were used on a limited basis the previous year, it was easier to integrate them into the lessons. Some teachers may not be as comfortable using materials other than the teacher's manual, so these strategies may not be as effective. New techniques need to be given sufficient time in order to assess whether or not these will be successful. Student mobility may cause the results to be less than anticipated, but improvement should still be noted. There is value in using these strategies in other content areas as well. The interventions described are most effective when used as a regular part of the teaching routine and used consistently throughout the course of the school year. It would be interesting to follow the classes as they progressed through the Junior High to ascertain long term benefits from continued use of the interventions.

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APPENDICES

APPENDIX A

Teacher Survey Concerning Comprehension

This is a survey for a graduate class. Participation is voluntary, responses are anonymous, and it is nongraded. Thank you for taking the time to complete it.

1. SSR(Silent Sustained Reading) helps to improve students' comprehension

   strongly agree agree disagree strongly disagree

2. Today's students have more difficulty comprehending basic text material.

   strongly agree agree disagree strongly disagree

3. Students' written and verbal responses show evidence of thinking about the question before answering.

   strongly agree agree disagree strongly disagree

APPENDIX B

NAME _____ DATE _____

Reading Experiences Inventory

A. Read each statement. Decide which word best describes how you feel about the statement: **Never, Sometimes, Often.** On the line, write **N** for *Never*, **S** for *Sometimes*, or **O** for *Often*.

1. I enjoy reading. ____
2. I find reading easy. ____
3. I find reading a bother. ____
4. I read the newspaper. ____
5. I read books for enjoyment. ____
6. I read magazines for enjoyment. ____
7. I read comic books for enjoyment. ____
8. I read books, magazines, and other materials to get information. ____
9. I use the school library for more than assignments. ____
10. I talk about books I have read with my family. ____
11. I go to the public library. ____
12. Television programs and movies give me ideas for things I want to read. ____

B. Below are listed several kinds of stories. Tell how you feel about each kind by putting a letter on each blank.

a. like very much b. like somewhat c. dislike

1. stories about real events in the past ____
2. stories about life in other countries ____
3. lives of real people ____
4. science and nature ____
5. record books ____
6. sports ____
7. adventure ____
8. stories that deal with feelings ____
9. mystery ____
10. science fiction (life in outer space or the future) ____
11. humor ____
12. fantasy ____
13. plays ____
14. poems ____

C. Answer the following questions by placing an **X** by the best answer.

1. About how much time per day do you spend reading, other than for school?

a. none ____ c. 30 to 60 minutes ____

b. 1 to 30 minutes ____ d. more than an hour ____

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NAME _____ DATE _____

Reading Experiences Inventory (continued)

2. About how many books do you read in one month?

a. none ____ c. 3 to 5 books ____

b. 1 to 2 books ____ d. more than 5 books ____

D. Finish these sentences as best you can.

1. If I read the newspaper, the sections I usually read are _____

_____

2. My all-time favorite book is _____

_____

3. My favorite author is _____

_____

4. The best book I have read in the last year is _____

_____

5. Some other books I've read are _____

_____

6. I get most of my reading material from the (Be specific.) _____

_____

7. I think reading is _____

_____

8. I usually read books because _____

_____

9. Some books, magazines, and comic books I own are _____

_____

10. I wish our public library had more of these materials: _____

_____

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APPENDIX C

DOUBLE-ENTRY JOURNAL

Name: _____ Date: _____

Grade: _____

Topic: _____

Initial Observation	Upon Reflection

APPENDIX D

JOURNAL STEMS

Name:_____ Date:_____

Grade:_____

Topic:_____

Select one of the following stem statements to use in your journal entry:

Stem Statements

A. The best part about.....

B. An interesting part is.....

C. I predict.....

D. I wonder.....

E. How.....

F. Why.....

G. A connecting idea is.....

H. I believe.....

Journal entry:

APPENDIX E

ON YOUR OWN

REFLECTIVE LESSON LOG

Directions: Try using this log with your students during a lecture.

Name: _____ Date: _____

Topic: _____

1. Key ideas from this discussion _____

2. Connections I can make with other ideas _____

3. Questions I still have _____

IRI SkyLight

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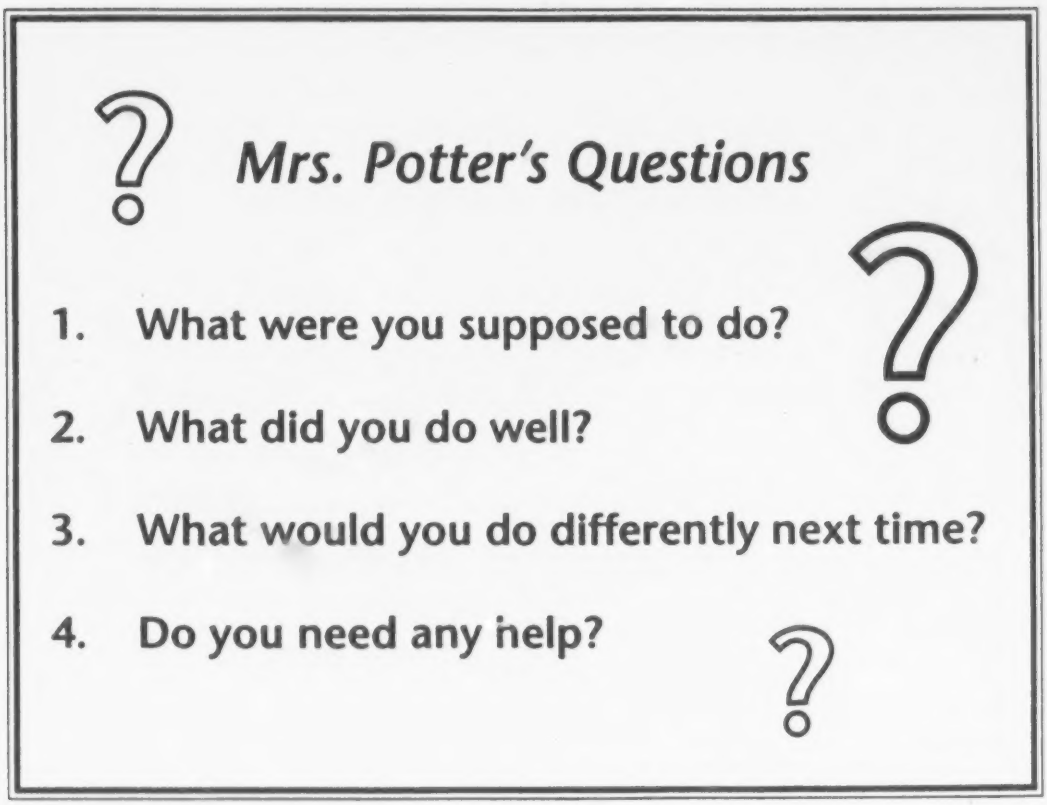
APPENDIX F

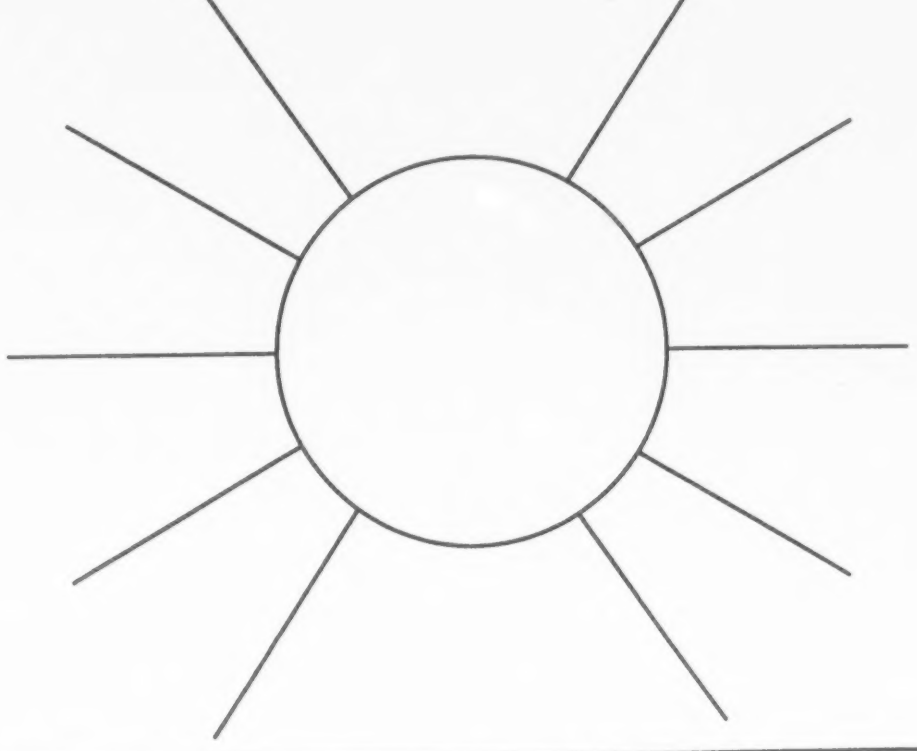

Mrs. Potter's Questions
1. What were you supposed to do?
2. What did you do well?
3. What would you do differently next time?
4. Do you need any help?

PMI
Thinking Skill: Evaluating

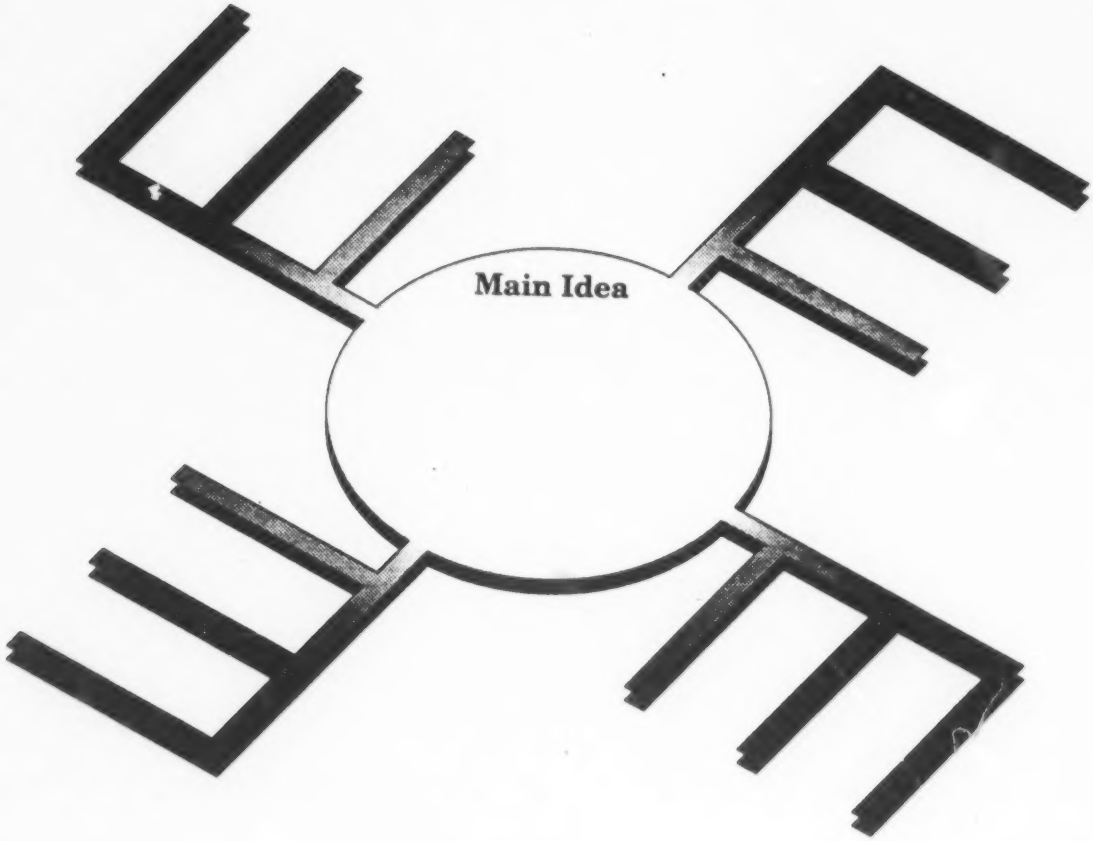
P+	
M–	
I?	

WEB

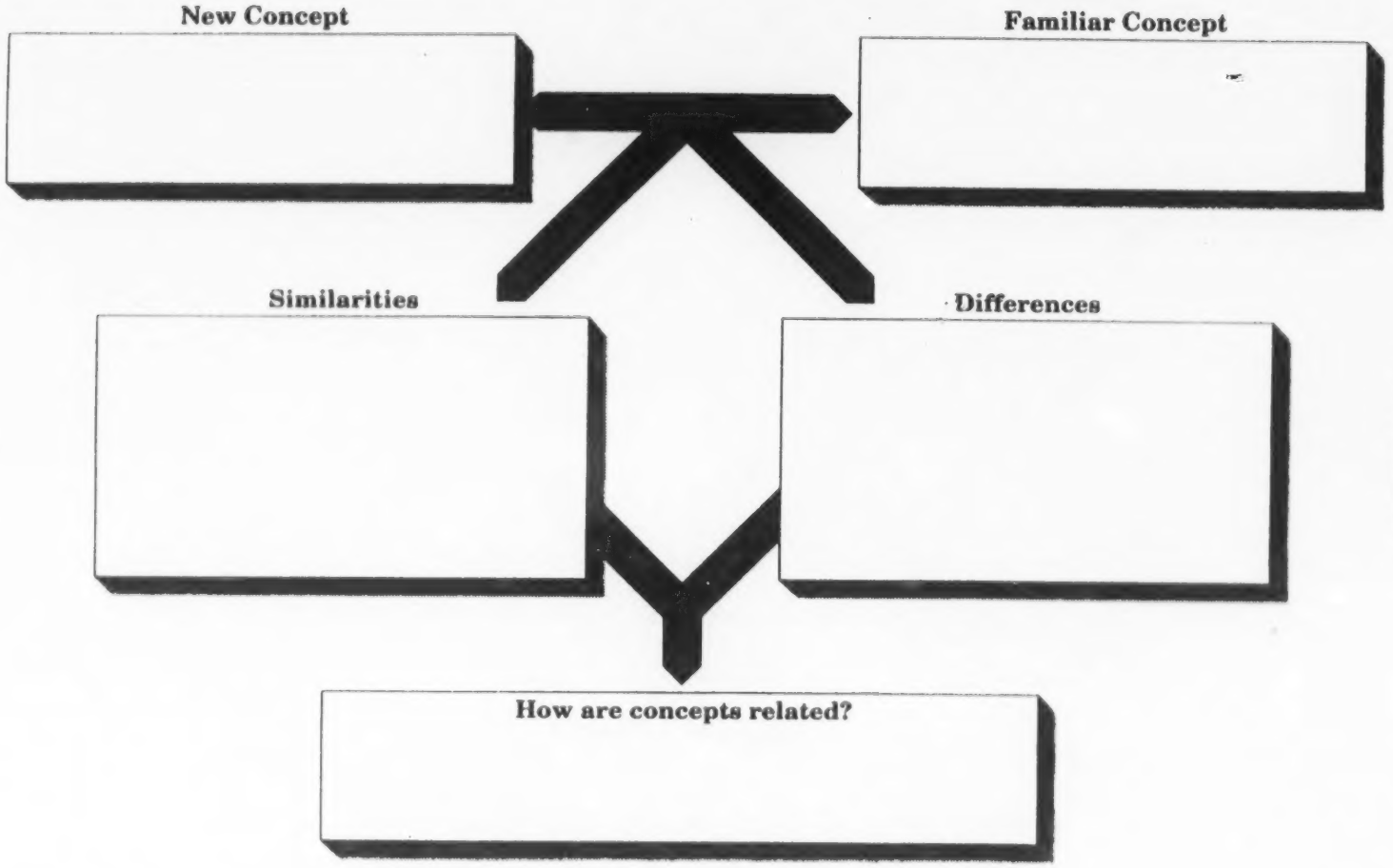
Thinking Skill: Analyzing Attributes



APPENDIX I



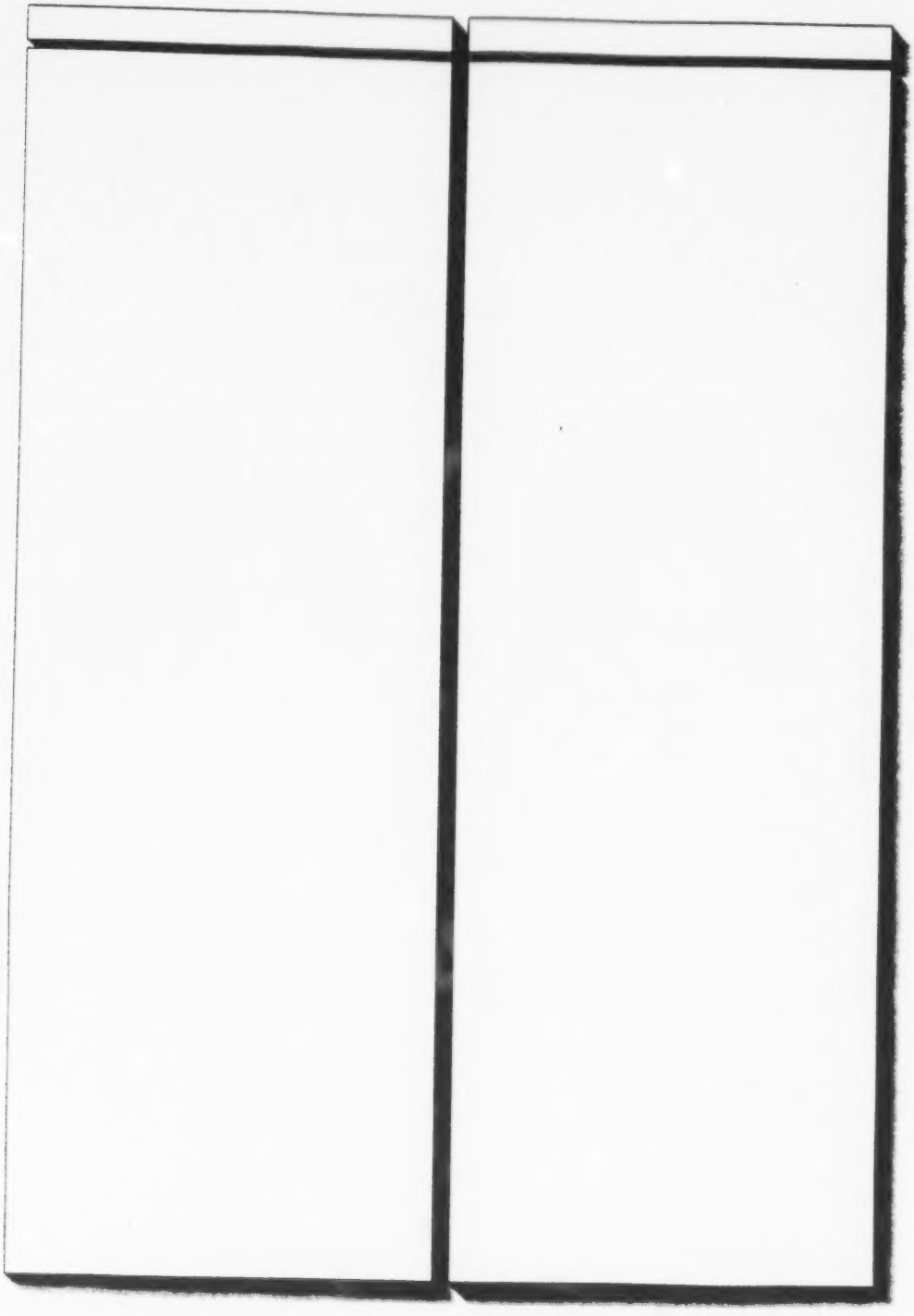
Main Idea and Supporting Details Text Pattern


New Concept
Familiar Concept
Similarities
Differences
How are concepts related?

APPENDIX J

Chart

APPENDIX K



What I Know	What I Want to Know	What I Learned

K-W-L Chart

APPENDIX L

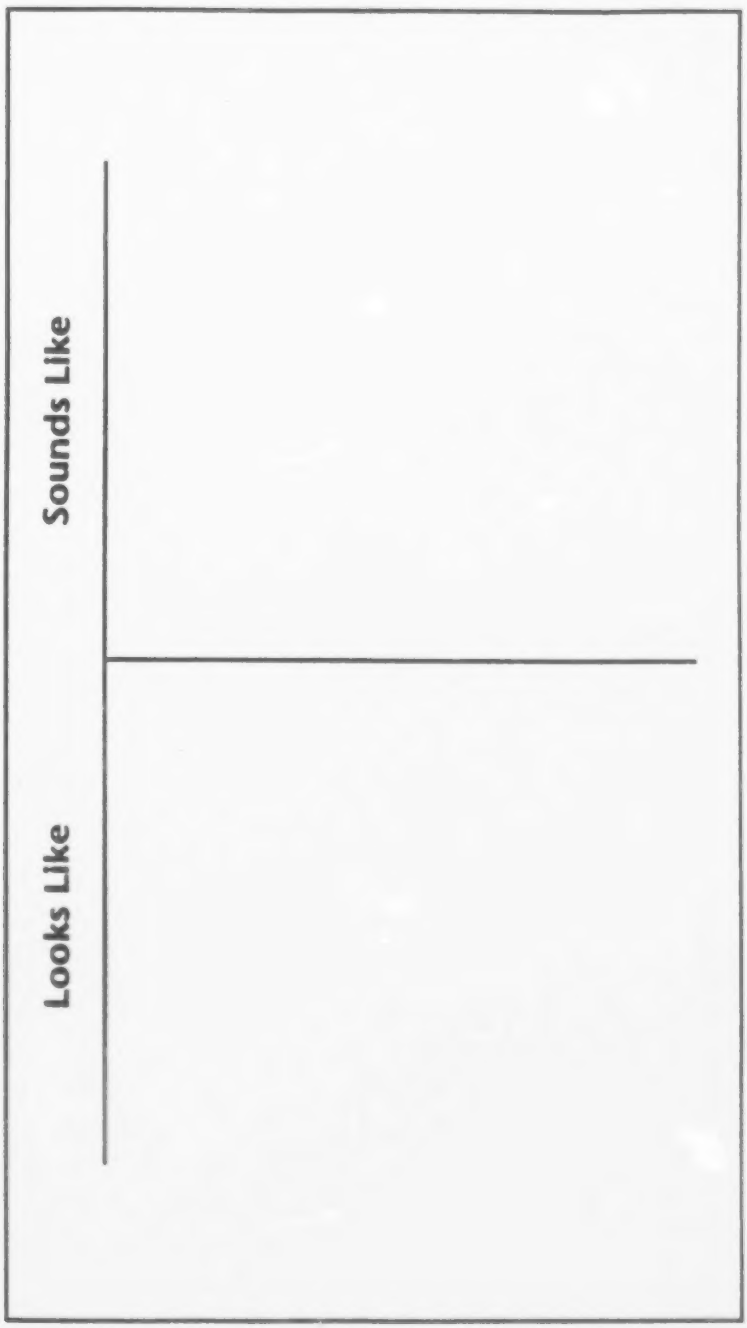
APPENDIX M

Prediction Chart

Pages	What I Predict	What Happens

APPENDIX N

T-CHART



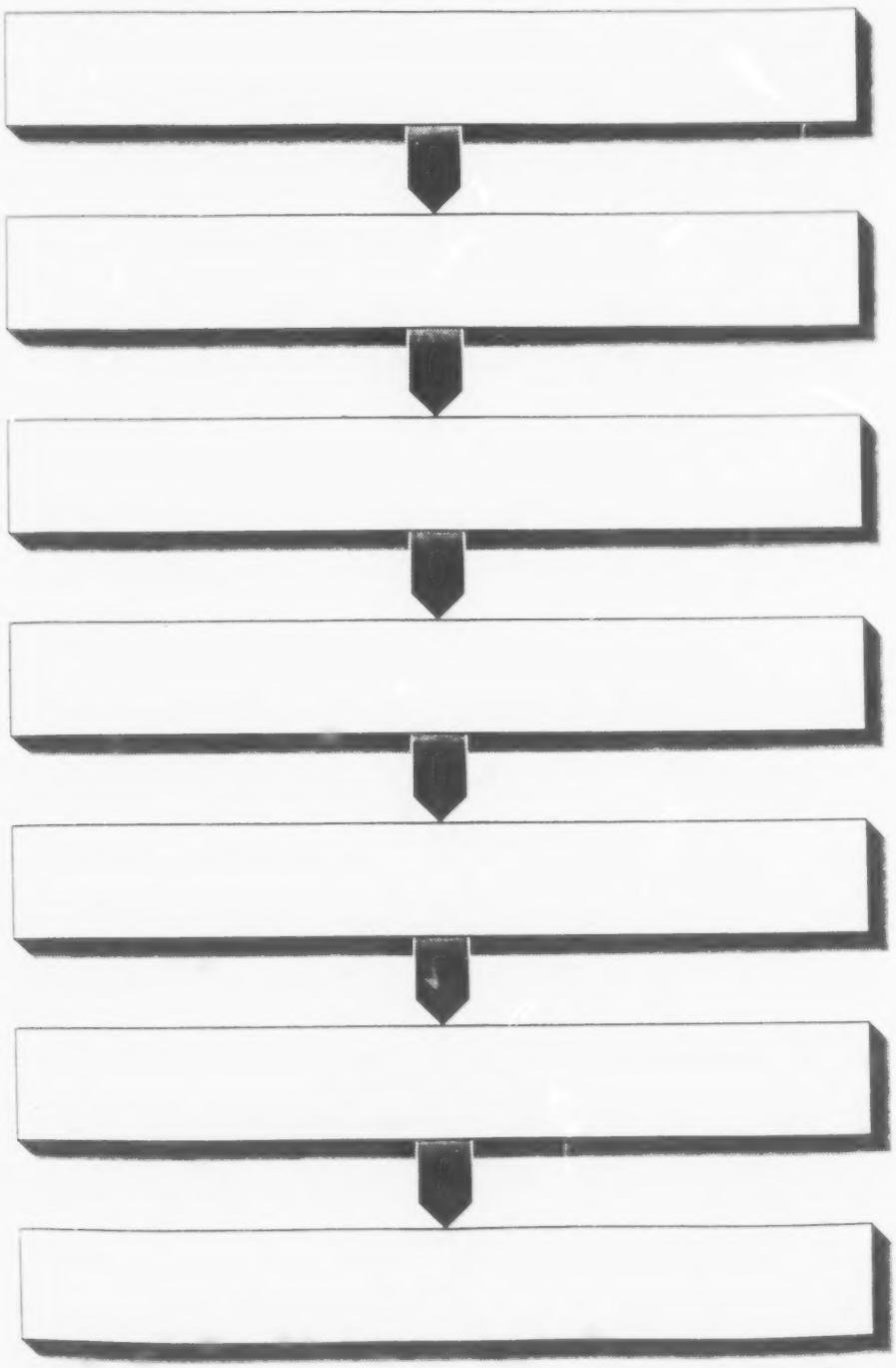
APPENDIX O

People Search

Find someone who . . .

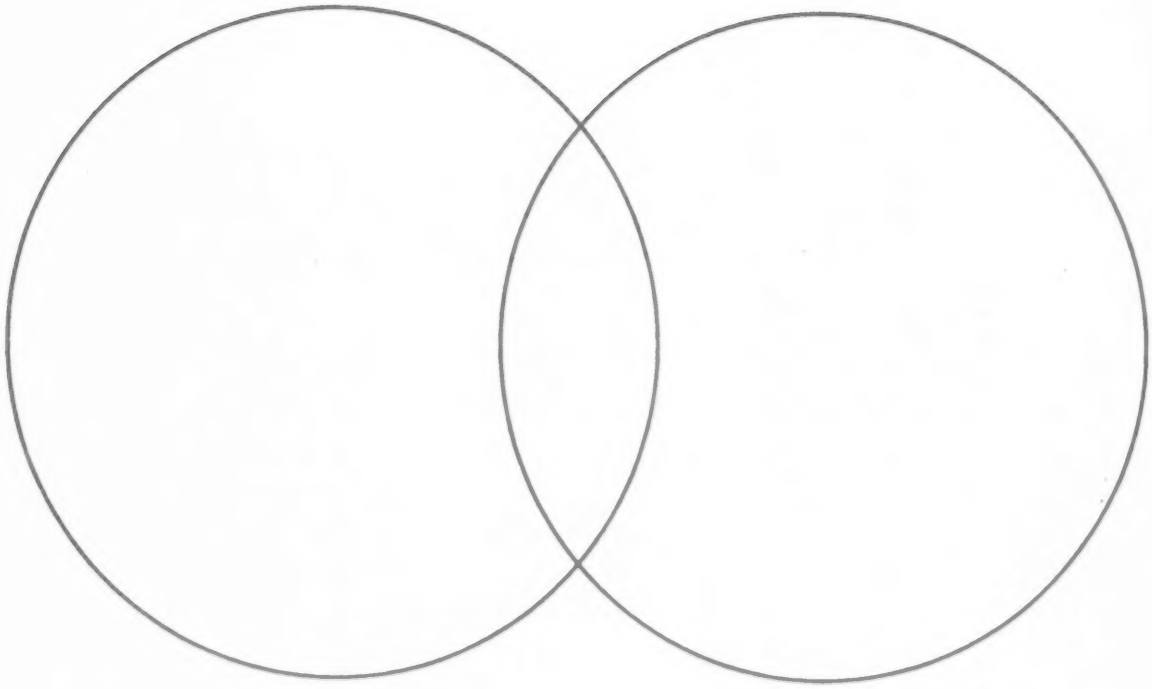
APPENDIX P

Sequence of Events



APPENDIX Q

VENN Diagram



APPENDIX R

Rubric for Comprehension Questions

The number of questions for each lesson may differ. One line will be used for each question.

1. _____

1	2	3	4
unclear	partial	mostly	fully

2. _____

1	2	3	4
unclear	partial	mostly	fully

3. _____

1	2	3	4
unclear	partial	mostly	fully

4. _____

1	2	3	4
unclear	partial	mostly	fully

APPENDIX S

STUDENT RUBRIC SCORE CHART